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MELESE FARRI (LEPIDOPTERA: NOCTUIDAE: ARCTIINAE): A NEW SPECIES FROM JAMAICA

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Abstract.—An ongoing survey of Jamaica's invertebrate fauna uncovered a species of arctiine moth, ***Melese farri* Murphy and Garraway, n. sp.** Members of the genus *Melese* Walker, occur throughout Central and South America; however, Trinidad is the only other Caribbean island from which a *Melese* species has been described. *Melese farri* in Jamaica raises questions concerning the biogeography of the genus *Melese* throughout the Caribbean.

Key Words: *Melese farri*, Arctiinae, tymbal organs, genitalia, Jamaica, South and Central America

In Jamaica, the clearing of lands to facilitate bauxite mining and road and house construction has led to the destruction of many habitats and the flora and fauna associated with them. Jamaica, with its high level of endemism (Government of Jamaica 1987), urgently needs to catalogue the invertebrate fauna before further species loss occurs. A survey of Jamaica's Lepidoptera fauna was undertaken to determine its status and generate checklists.

Twenty locations across the island were sampled between 1995 and 2000. Thirteen specimens of a previously undescribed species from the subfamily Arctiinae, tribe Arctiini, were collected from four sites, Windsor and Dromilly in the Cockpit Country, Trelawny Parish; Accompong Maroon Village in St. Elizabeth Parish and a single specimen from St. Toolis in southern Manchester Parish in central Jamaica. This species is placed in the genus *Melese* Walker based on general external morphology and the structure of the female genitalia.

Based on museum collections, the genus *Melese* appears to be a native of Central and South America with 35 species (Watson 1971), identified from this region. In the Caribbean, Trinidad is the only island with any record of this genus. *Melese incertus* (Walker) (*flavipuncta* Rothschild) is reported from Trinidad (Watson and Goodger 1986) but Trinidad is regarded as having a South American fauna because of its proximity to Venezuela. The absence of any record of *Melese* species from other Caribbean islands might be due to a lack of study in these areas; its occurrence in Jamaica however suggests that there may be members of the genus in other Caribbean islands.

A description of the new species from Jamaica, including descriptions of male and female genitalia and tymbal organs, is given.

MATERIALS AND METHODS

Moths were collected at hourly intervals between dusk and dawn using

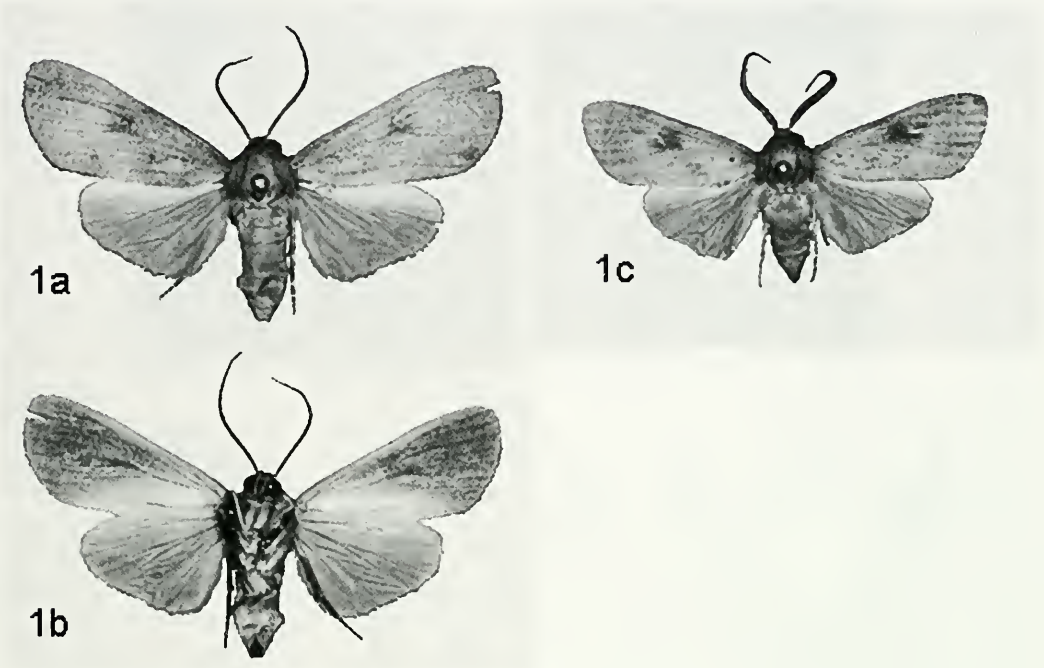


Fig. 1. *Melese farri*, adult. 1a, Female dorsal. 1b, Female ventral. 1c, Male dorsal.

a modification of Robinson's light trap with 125W mercury vapor lamps and plastic buckets. After dispatch with ethyl acetate, spread specimens of suspected arctiines were examined, their sex determined and the moths described with the aid of a stereo-microscope with zoom objective. Dorsal and ventral surfaces of both sexes were photographed. The wings of males and females were measured, from the apex to the point of attachment to the thorax, following which, they were prepared for venation studies according to the method outlined in Borror et al. (1992). Specimens were classified using general description keys (Borror et al. 1992; Heppner 1993) and this classification adjusted based on Lafontaine and Fibiger's revised classification of the Noctuoidea (2006). Identification to species demanded comparison with specimens at the Institute of Jamaica, the Carnegie Museum in Pittsburgh, Pennsylvania, and The Natural

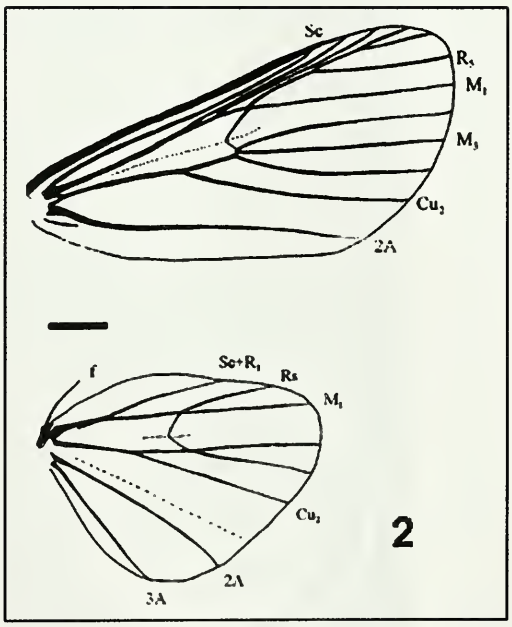
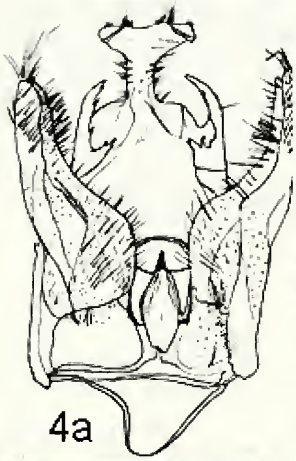


Fig. 2. *Melese farri*, right wings. Scale bar = 2.0 mm.


3a


3b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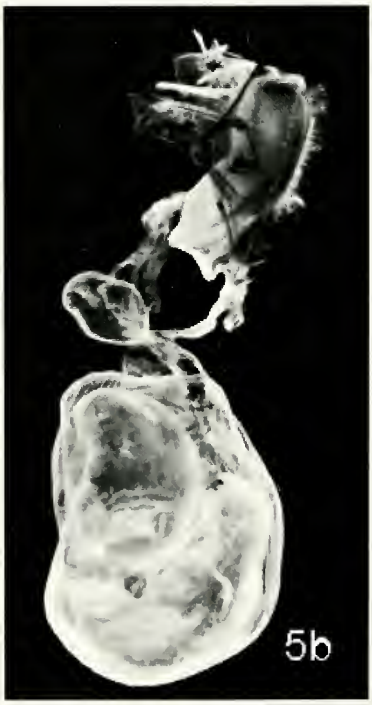
4b


4c


5a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History Museum in London. Arctiines from the American Museum of Natural History which were loaned to the Carnegie Museum at that time were also examined.

Genitalia studies required the removal of the posterior halves of abdomens, maceration in potassium hydroxide solution (10% for males, 5% for females) overnight, then dissection of the genitalia followed by repeated washing in distilled water and storing in 50% iso-propanol. Male genitalia were further treated by removing aedeagi and eversion of vesicae; valvae were also spread to show their inner surfaces. Male and female genitalia were described, photographed or otherwise illustrated and measured following which they were dehydrated and stored separately in vials of absolute iso-propanol.

Hindlegs of specimens were removed to facilitate tymbal organ studies. Scales on the meta-thoracic episternite were described then removed by abrasion with insect pins to reveal tymbal organs. These organs were described and photographed.

Results

Melese farri Murphy and Garraway, new species

(Figs. 1–5)

Material examined.—*Holotype*: ♂, Jamaica: St. Elizabeth Parish, Accompong Maroon Village, C. P. Murphy and E. Garraway in light trap, 02-03-viii-1997. Deposited in the Entomology Museum, University of the West Indies, Mona, Kingston, Jamaica.

Paratypes: 1♂, 02-viii-97, 1♂ 03-viii-97, 1♀ 02-viii-97, 1♂, 03-04-viii-97, Jamaica: same data as holotype; 1♂, 1♀, Trelawny Parish, Windsor, Cockpit Country, 09-vii-99; 1♂, 1♀, 04-x-99, 2♂, 24-ix-2000, 3♂ 24-25-ix-2000, Windsor; 1♂, Manchester Parish, St. Toolis, 04-02-2000. Deposited with holotype.

1 ♂, Windsor; 24-ix-2000, 1 ♀, Trelawny Parish, Dromilly, Cockpit Country, 27-iv-2001. Deposited in the Insect Collection at the Institute of Jamaica, 12 East Street, Kingston, Jamaica.

Diagnosis.—The species is similar in appearance to *Melese columbiana* Rothschild from Santa Fé de Bogotá. Male specimens of *M. columbiana* have three white lines along the basal 2/3 of the costal margin with a white spot between the second cubital vein and the second anal vein. Jamaican specimens have no white spot and there is a black spot at each forewing base between the second anal vein and the inner margin of the wing. Females of *M. columbiana* possess several white spots as well as white lines on each forewing.

Description adults (Fig. 1).—*Head*: Vertex gray brown, rough scaled; frons darker. Antenna bipectinate, tapering; rami lined with cilia; scape pink on outer lateral surfaces, brown on inner surface; antennal shaft brown with scales on a few basal segments, pink color decreasing distally. Female antenna less feathery. Compound eye prominent, ringed with brown scales; proboscis developed; ocellus in shallow groove behind antennal scape; labial palpus three-segmented, upturned, reaching up to brown vertex.

Thorax: Patagium and tegula covered with various shades of dark brown scales. Forewing, mixture of brown and dark brown, with a black spot near its base and a brown discal spot of irregular shape. Hindwing bright orange pink; overlap region of fore- and hindwings

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Figs. 3–5. *Melese farri*. 3, Tymbal organs, male (a), female (b). 4, Male genitalia, dorsal (a), lateral (b), aedeagus with everted vesica (c). 5, Female genitalia, ventral (a), lateral (b).

pale, almost golden in color. First anal vein (1A) weak in hindwing (Fig. 2), completely absent in forewing. Ventral wing surfaces like dorsal, except black spots absent.

Forewing length (male) 13.0–16.0 mm, mean 14.6 mm, n = 10.

Forewing length (female) 15.0–16.0 mm, mean 15.7 mm, n = 4.

Metepisternites lightly covered with small, circular scales which when removed, reveal tymbal organs comprising translucent blisters each bearing a striated band of 20 to 22 raised bars with rounded ends in female (Fig. 3) and 16 to 20 bars in male (Fig. 3); bands taper at both ends. Each bar bears several striae. Coxa of foreleg bright orange pink with dark brown scales on basal half of outer surface; coxae of mid- and hindlegs similarly but less brightly colored. Foreleg femur brown on outer, orange pink on inner surface; foretibia dark brown along outer edges, orange pink near base; rings of light brown scales at tibial-tarsal joints and at base of tarsal segments. Tibiae of other legs similarly colored. Coloring on female legs less intense than that of male. Foreleg bears epiphysis, mid- and hindlegs one and two pairs of tibial spurs respectively.

Abdomen: Dorsal surface with orange pink hairs on first three segments, short smooth scales on remaining segments; ventral abdomen with orange pink scales; lateral abdomen brown. Abdomen of female larger than male and more rounded.

Male genitalia (Fig. 4): Lightly sclerotized with doubly indented anterior margin. A rectangular hood projecting from caudal margin gives rise to bifurcate, setose, rodlike uncus. Arising from caudal tegumen and ventrolateral of uncus, a pair of thin plates bearing several large spines at their distal margins curve towards each other. Lightly sclerotized diaphragma forms wide tubular anellus; juxta small. Vinculum, a thin rod, expands ventrally forming a well-developed saccus.

Well-developed valvae attach to tegumen laterally. Base of each valva large; setose sacculi meet at their bases. Each valva bears a short ridge on its inner surface, a valvula and a setose cucullus, a small triangular projection from costa. Distal valva covered thickly with hairs on inner and outer surfaces. Aedeagus with distinct rounded coecum penis, ductus ejaculatorius bulges where it meets phallus giving aedeagus a bilobed appearance. Everted vesica covered with spines.

Female genitalia (Fig. 5): Papillae anales triangular, sclerotized, setose lobes, with two pairs of short apodemes and a pair of triangular dorsal pheromone glands which arise posteriorly. Ostium bursae's position marked by a notch in narrow genital plate. Ostium bursae opens into antrum of ductus bursae which continues as a curved tube and connects with corpus bursae via a short, unsclerotized neck. Corpus bursae, large, spherical with regularly spaced crenulations running longitudinally along its outer surface and covered with small regularly spaced pimples. Ventrally, corpus bursae bears a large, leaf-shaped, highly sclerotized signum; a smaller signum occurs on dorsal surface. Appendix bursae, a small spherical sac, arises from anterior corpus bursae adjacent to ductus bursae. A short tube arising from posterior appendix bursae, ductus seminalis, bears an ovoid sac, or spermatheca which in turn leads to an oblong-shaped bulla seminalis before joining vagina.

Etymology.—The species is named for the late Dr. Thomas Farr, entomologist at the Institute of Jamaica, the island's national museum. Dr. Farr, the only resident insect taxonomist on the island for four decades, died in 1996. His work encouraged us to undertake the present survey.

Discussion.—The external morphological similarities (body and wing color

and size) between *M. farri* and other *Melese* species from Central and South America is immediately apparent. Placement among the Arctiinae is supported by studies of wing venation, quadrifid forewing, and trifine hindwing (Fig. 2). Comparison of the female genitalia with those of *Melese rubricata* Dognin and *Melese flavimaculata* Dognin from French Guiana and Ecuador, respectively, supports inclusion in the genus.

Melese farri appears to be somewhat restricted in its Jamaican distribution. Of the thirteen specimens collected, all except one was found in the Cockpit Country, a moist to wet limestone forest known for its large number of endemic vascular plants (Proctor 1986). The single specimen collected outside of the Cockpit Country occurred in St. Toolis which comprises a series of rocky limestone hills with a secondary dry limestone forest. The specimen from St. Toolis was collected in February in one of the dry seasons in Jamaica while those from Cockpit Country sites were collected between July and September, another dry season. Monthly collections in both the Cockpit Country and St. Toolis would identify the breeding season for this species and would clarify whether it favors wet forest conditions or cool, dry conditions. Although *M. farri* appears to favor the Cockpit Country, it might not be endemic to this region.

The genus *Melese* appears to be Neotropical and its occurrence in Trinidad is not surprising. Its absence so far from other Caribbean islands is surprising and its occurrence in Jamaica raises questions concerning its origin and biogeography throughout the Americas.

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